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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,338	03/26/2004	Ahmad Absar	03108/0201075-US0	8253
7278	7590	06/01/2007	EXAMINER	
DARBY & DARBY P.C. P.O. BOX 770 Church Street Station New York, NY 10008-0770			WARE, DEBORAH K	
		ART UNIT	PAPER NUMBER	
		1651		
		MAIL DATE	DELIVERY MODE	
		06/01/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/810,338	ABSTAR ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Deborah K. Ware	1651

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 06 March 2007.
- 2a) This action is **FINAL**.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-12 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-12 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_.
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) Notice of Informal Patent Application
- 6) Other: \_\_\_\_\_.

## **DETAILED ACTION**

Claims 1-12 are presented for reconsideration on the merits.

### ***Response to Amendment and Exhibit A***

The amendments and Exhibit A filed March 6, 2007, have been received and entered. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Claim Rejections - 35 USC § 103***

Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mukherjee et al US2003/0186404 in view of Lauf et al (6444453) and Li et al (5527466), all cited on previously enclosed PTO-892 Form.

Claims are drawn to a process for producing oxide nanoparticles while controlling their shape and size comprising incubating a wet fungus or extract with a metal salt solution to obtain a biomass, separating the biomass and filtering oxide nanoparticles from the biomass.

Mukherjee et al teach a process for producing sulfide nanoparticles comprising incubating a wet fungus or extract with a metal salt solution to obtain a biomass, separating the biomass and filtering nanoparticles from the biomass. Note pages 1-3, all lines.

Claims differ from Mukherjee et al in that the synthesis of shape, size and polymorph controlled oxide nanoparticles are not produced.

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Lauf et al teach a process for producing mixed oxide nanoparticles comprising treating a thermophilic microorganism with a metal salt solution to produce oxide nanoparticles using a temperature between 25 and 85 degrees celsius, note column 13, lines 30-35 and column 14, lines 20-25.

Li et al teach obtaining/removing oxides from a biomass by filtering during wet oxidation of sludges between a range of pore sizes that include at least 1 micron, note column 1, lines 15-20, and column 2, lines 61. The materials so obtained can be in various shapes and sizes, note column 5, lines 45-55.

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to select for a fungal microorganism as disclosed by Mukherjee et al to provide for the synthesis of shape, size and polymorph controlled oxide nanoparticles as disclosed by Lauf et al and Li et al. Mukherjee et al clearly teach that nanoparticles can be produced or synthesized by a process comprising incubating a wet fungus or fungal extract with an aqueous metal salt solution, to obtain a biomass, separating the biomass and filtering nanoparticles therefrom.

The temperature disclosed by Mukherjee et al is clearly between 15 to 40 degrees celsius, 23 to 33 degrees celsius and 25 to 29 degrees celsius, note page 3, all lines. The time period is also disclosed wherein 2 or more hours is clearly taught. The metal salt can be a zinc sulfate. The fungus can be of the genus Fusarium. The metal salt is not less than 1 mM. Further, the wet fungus is in the range of 10 to 60 mgs. In addition, Zinc is a selected transition metal.

Lauf et al clearly disclose a treatment temperature range within the claimed range, note column 14, line 30. Also to select for a different thermophilic microorganism is taught, or at least suggested, by the cited prior art combination because the temperature range disclosed by Mukherjee et al clearly suggests a thermophilic fungus. Therefore, to employ the identical conditions on a thermophilic microorganism clearly recognized in the prior art to be capable of producing nanoparticles at those conditions is well within the purview of an ordinary artisan. Furthermore, Li et al clearly recognized synthesis of shape, size and polymorph controlled particles by selectively controlling filter pore size and employing a filtering step as claimed by Applicants' process.

The pore size is clearly disclosed by Li et al to be selected within the range of at least 1 micron to obtain varied sizes and shapes of particles of materials. Hence the selection of a filtering step and pore size to provide synthesis of shape, size and polymorph controlled oxide nanoparticles is within the skill of an ordinary artisan. No unexpected results have been obtained and one of skill would have been motivated to select for a fungus microorganism because it is well recognized to produce nanoparticles. Thermophilic microorganisms are well known to produce oxide nanoparticles and to select for a thermophilic fungus is suggested by the cited prior art combination. The claims are *prima facie* obvious, therefore.

This is not a new ground of rejection since Applicants' arguments are directed to the Patent Publication US2003/0186404 that issued as Patent No. 6,783,963, and further because Applicants have presented arguments to both.

***Response to Arguments***

Applicant's arguments filed March 6, 2007, have been fully considered but they are not persuasive. The argument that their Exhibit A shows that they have conception prior to October 2, 2003 is noted, however, the application was never filed in India and Applicants have not shown that the conception took place in the United States. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Lauf does clearly teach production of oxide nanoparticles. Li teaches the materials so obtained can be in various shapes and sizes (i.e. polymorph), and these teachings combined with the primary reference which does teach fungal-mediated synthesis of nanoparticles albeit they are sulfide nanoparticles and not oxide nonoparticles, but the use of a metal salt solution as disclosed by Lauf does show that production of oxide nanoparticles are desired and can be produced using a metal salt solution.

Furthermore, while the capability of any microorganism to form nanoparticles may not be well-understood the prior art does teach the same conditions employed as Applicants' process. Also the prior art clearly suggests that different genera are used to produce oxide nanoparticles and under appropriate conditions the prior art clearly suggests and would have motivated one of ordinary skill in the art to select for a fungus or fungal extract because one of skill would have merely had to select for appropriate conditions such as providing for the presence of an electron donor to reduce a metal to an oxide and then obtaining the oxide nanoparticles via filtration. Thus, while different species may show different levels of activity they are recognized by the cited prior art to be capable of forming oxide nanoparticles within a reasonable expectation of success under appropriate conditions. The rejection is, therefore, sustained.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to

be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-12 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims U.S. Patent No. 6,783,963 ('963) in view of Lauf et al and Li et al.

Claims are discussed above.

Each of these cited prior art documents are also discussed above.

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to select for a fungal microorganism as disclosed by Mukherjee et al to provide for the synthesis of shape, size and polymorph controlled oxide nanoparticles as disclosed by Lauf et al and Li et al. Mukherjee et al clearly teach that nanoparticles can be produced or synthesized by a process comprising incubating a wet fungus or fungal extract with an aqueous metal salt solution, to obtain a biomass, separating the biomass and filtering nanoparticles therefrom. To select for controlled shape and size of these particles as disclosed by Li et al is clearly within the purview of an artisan. Each of the claim limitations are either claimed by '963 or disclosed by Lauf et al and Li et al.

To select for a fungus is clearly an obvious modification since the use of thermophilic microorganisms to produce oxide nanoparticles is disclosed by Lauf et al. One of skill would have been motivated to select for a fungus employing the identical conditions for producing oxide nanoparticles because nanoparticles are produced by

'963 and thermophicity of the fungus is suggested by the cited prior art because of the disclosed overlapping temperatures in which both '963 and Lauf et al disclose are successful for producing sulfide and oxide nanoparticles. The claims are hence obvious for these reasons and for those discussed above.

***Response to Arguments***

Applicant's arguments filed March 6, 2007, have been fully considered but they are not persuasive for those reasons noted above.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

All claims fail to be patentably distinguishable over the state of the art discussed above and cited on the enclosed PTO-892 and/or PTO-1449. Therefore, the claims are properly rejected.

The remaining references listed on the enclosed PTO-892 and/or PTO-1449 are cited to further show the state of the art.

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No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deborah K. Ware whose telephone number is 571-272-0924. The examiner can normally be reached on 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Deborah K. Ware  
May 26, 2007



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